

Assessing food aid requirements

a revised approach

Assessing food aid requirements **a revised approach**

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I. INTRODUCTION

Food aid represents one tenth of the total external assistance made available to developing countries. Although the origin of food aid lies in the surplus disposal activities of the 1950s and 1960s and this link has never been totally severed, over the years there has been a noticeable shift of emphasis from surplus disposal to the nutritional and developmental aspects of food aid. Food aid is no longer regarded merely as a morally expedient form of reducing excess stocks, and not even only as a straight food transfer from the richer to the poorer to improve human nutrition, but also as a capital or foreign exchange transfer for development purposes.

The impetus for a new approach to the international food aid system was provided by the world food crisis of the early seventies which dramatized the need for an international commitment to provide, on a regular basis, an adequate quantity of food on concessional terms. Continuity of food aid supplies and the implied institutionalization of food aid commitments became more important as food aid was more systematically used in national development programmes.

These concerns are reflected in the recommendations of the World Food Conference in 1974 which established a minimum target for global food aid in cereals, and the subsequent Guidelines and Criteria for Food Aid, adopted by the UN/FAO Committee on Food Aid Policies and Programmes in 1978. The same tendency has been apparent in the practices and pronouncements of the major bilateral food aid donors in recent years, and in the growing number of non-traditional food aid donors under the Food Aid Convention.

The Guidelines and Criteria call on the donor countries to accept and implement forward planning of food aid, preferably on a multi-annual basis. In allocating food aid, priority is to be given to low-income, food-deficit countries, with an increasing proportion of food aid being channelled through multilateral institutions.

Some progress has been made in implementing these new objectives and it is now generally recognized that food aid has made substantial contributions towards economic development, yet the concept still remains controversial in the economic literature.^{1/} Inevitably, any attempt to assess food aid requirements raises many questions which have important implications for the methodology to be adopted. There remain important methodological issues to be resolved, and serious data deficiencies further complicate the task. Estimates of food aid requirements must be based on data which are neither complete nor altogether accurate, as well as on assumptions relating to economic growth in over 100 developing countries, the level of domestic food production, effective demand for food, export earnings, capacity to import commercially, market prices and other related variables. It is not possible to incorporate all relevant factors even in the most sophisticated model.

Forecasting food aid requirements, like so many other assessments of the future, is thus a complex, imperfect art and must be recognized as such. Nonetheless, notwithstanding the conceptual, theoretical and methodological issues involved, food aid continues to flow and both donors and recipients recognize the need for forward planning and seek objective criteria in the allocation of food aid, based on more systematic assessments of requirements.

The approach set out in this paper was developed in the Commodities and Trade Division of FAO which gratefully acknowledges the advice of other technical units of FAO as well as of World Food Programme staff who contributed to the work on which this report is based. The approach was used in the assessment of food aid requirements prepared jointly by FAO and WFP for the 15th Session of the Committee of Food Aid Policies and Programmes (WFP/CFA, 1983) 2/.

This paper elaborates in some detail on the methodology behind that assessment. Chapter II presents a review of methods previously employed, by FAO and others, in estimating food aid requirements. The approach used in this paper is described in detail in Chapter III. Chapter IV presents estimates of food aid requirements based on this revised methodology, together with estimates of project food aid needs prepared by WFP, and compares them with other estimates. Overall conclusions are given in Chapter V.

1/ The argument in favour of using food aid as a development resource remains as strong as elaborated a quarter of a century ago (FAO, 1954 and 1961). IDS (1983) provides a good collection of articles and views representing present thinking and evidence in this area.

2/ See "Literature Cited", page 21.

II. REVIEW OF PAST APPROACHES TO ESTIMATE FOOD AID REQUIREMENTS

Most assessments of food aid requirements have dealt primarily with the chronic and growing deficit between domestic food requirements and availabilities. In all assessments the food deficit is expressed in terms of a cereal deficit, and imbalances in other foodstuffs have been taken into consideration only to a limited extent, although food aid shipments in non-cereal commodities are substantial. While these commodities often are important in project aid where balanced rations need to be provided to deprived populations, as is for instance the case in many emergency feeding programmes, it is very difficult to arrive at specific estimates of non-project food aid requirements. In fact, donor decisions concerning the actual amounts of non-cereal commodities provided as food aid are still governed to a considerable extent by the availability of excess supplies.

Projections of food aid requirements in cereals have invariably been based on explicit assumptions on consumption, domestic production and trade. These involve either extrapolations of past trends or normative considerations related to income growth, the capacity to purchase food commercially, or both. Some estimates also take into account minimum nutritional goals or make specific allowance for food aid requirements to meet emergency needs and to build - or re-build - food security stocks. Detailed behavioural relationships about economic activity and consumer behaviour in food-deficit countries have not been incorporated into food aid projection models. The analyses are partial also from another point of view, that is they consider only a subset of food producing and trading countries and consequently the working of the world cereal market in its totality is not taken into consideration.

The main assumptions underlying different estimations of food aid requirements relate to three aspects: (a) consumption coverage, i.e. the elements of the total potential requirements that have been included; (b) assessment of a country's ability to import cereals commercially; and (c) recipient country coverage, i.e. the criteria used in the inclusion of countries as potential food aid recipients. A comparison of the different approaches in relation to these assumptions is presented in Chapter IV where the results of the methodology employed in this paper are discussed. The following discussion outlines the context within which past assessments were made and refers briefly to the main assumptions on which they were based.

The FAO study Agriculture Toward 2000 (FAO, 1981) included assessments of food aid requirements for 1990 which were based on two alternative scenarios regarding economic development in developing countries. In an optimistic scenario, an accelerated pace of economic development and faster growth of food production and effective demand were assumed, which would slow the growth in cereal import deficits. In assessing food aid requirements, the approach differentiated between two groups of developing countries, reflecting their relative ability to pay for cereal imports. For the "most vulnerable" group comprising 57 low-income food-deficit countries, it was assumed that they would continue to depend on food aid for one third of their cereal import needs, the same share as in 1978-79; for the remaining higher income developing countries, the ratio of food aid to total cereal import requirements was assumed to average 10 percent.

Under an alternative medium-growth scenario, in which less optimistic growth rates of both agricultural production and demand were assumed, the countries concerned would have greater difficulties in financing food imports because of an also more modest growth of their export sector. In this case, for the 57 most vulnerable countries a considerably larger share (45 percent) of their cereal import requirements was assumed to be covered by food aid, equal to the share prevailing during 1969-71 before the world food crisis. For the higher income developing countries considered in the analysis, food aid needs were assumed to amount to 10 percent of their cereal deficit, the same proportion as in the optimistic scenario. On these assumptions, food aid requirements of all developing countries were estimated to amount to 15 and 24 million tons in 1990, under the optimistic and medium growth scenarios respectively. Of this total, over 80 percent would be required by the 57 most vulnerable countries.

Two other methods of assessing food aid needs of developing countries have been developed and applied recently, one by the United States Department of Agriculture (USDA, 1982 and 1983) and the other by the International Food Policy Research Institute (IFPRI, 1983). The USDA model aims at the short term and is used to provide estimates of food aid needs, updated every six months, for the season immediately ahead. The purpose is to formulate a systematic and objective basis for

calculating country needs in order to provide a continuous guidance for the allocation of scarce food aid resources. Two methods were used to estimate food aid needs. The first, the "status quo" method, estimates import requirements needed to maintain the per caput calorie intake achieved during a recent base period. The second, nutrition-based method, compares domestic food availabilities to the FAO/WHO recommended nutritional standard in order to arrive at a measure of import requirements.

In both methods used by USDA, the ability of each country to import commercially was assessed. This assessment is carried out in three steps. First, the country's total availability of foreign exchange is assessed, based on projected export earnings adjusted by allowances for the accumulation or drawdown of reserves and debt-service payments. Second, the amount of foreign exchange to be applied toward commercial food imports is determined, based on the portion of total export earnings spent on food imports during a base period. Finally, the volume of commercial food imports is computed by projecting import unit values of the commodity mix imported by individual countries. In the latest USDA publication (USDA, 1983) total cereal import requirements for 1983/84 of the 67 developing countries covered are estimated at 29.8 million tons and 48.5 million tons under the status quo and nutrition-based assumptions respectively. Of these totals, food aid needs are estimated at 12.4 million tons, to maintain their per caput food status quo. Nearly 33 million tons would be needed to raise per caput intake to that corresponding to the FAO/WHO recommended nutritional standard.

IFPRI's study examined past food aid and commercial trade flows and made projections of food aid requirements in 1990. Food aid recipient countries were classified into low and middle income groups. A GNP per caput of US\$ 300 in 1977 was used as dividing the two groups. Countries with GNP per caput above US\$ 900 were considered as no longer qualifying for food aid. For the remaining middle-income countries, eligibility criteria for inclusion in the food aid recipient category were based on a judgement concerning each country's capacity to finance imports and the level of domestic per caput staple food production. A ratio of export earnings to GNP of less than 33 percent and per caput staple food production of less than 1 800 calories were taken as indicators of difficulty.

Food aid requirements were assessed assuming that countries eligible for food aid could finance cereal imports on commercial terms up to an amount which, at maximum, would absorb five percent, or alternately two percent, of their export earnings. The two percent level was assumed for countries for which the ratio of foreign exchange reserves to total merchandise imports was less than 25 percent. According to this method, food aid requirements of the 57 countries assumed to be eligible for food aid in 1990, range between 16.6 million tons, for a scenario based on effective demand, to 35.4 million tons necessary to meet the FAO/WHO recommended nutritional standard.

In the IFPRI study, the assumed upper limits of five and two percent of export earnings for commercial cereal imports are somewhat arbitrary as they do not take into account each country's experience in the allocation of foreign exchange for cereal imports. For several countries the ratio of expenditures for commercial cereal imports to export earnings have historically been as low as one percent and for others as high as 20 percent. Thus, although the criteria used by IFPRI for assessing the ability of individual countries to pay for their cereal imports appear objective, they do not coincide closely with past experience of individual countries.

The above assessments dealt with aggregate food aid requirements and did not recognize explicitly the various components of food aid needs and the aims of different food aid interventions in food deficit countries. However, differentiation between the various needs for food aid is becoming increasingly important in view of the tightening of total food aid supplies and the attendant new orientation of food aid towards developmental objectives. In view of these considerations, total food aid requirements of food deficit countries can be divided into the following elements:

- a) Non-project aid, which provides balance of payments and budgetary support for general economic development, lessening or obviating the need for recipient governments to reduce other vital imports in order to meet the most urgent food requirements of the population;
- b) Project aid, including support for nutrition programmes, food-for-work projects for stimulating rural development and food production, and the building up and/or replenishment of national food reserves; and

c) Emergency aid, for meeting food shortages caused by sudden natural calamities, such as earthquakes and floods; man-made disasters, often leading to a flow of refugees; and crop failures due to drought and other natural causes.

This disaggregated approach was used in the estimation of food aid requirements prepared jointly by FAO and WFP in 1979 (WFP/CFA, 1979). In view of the expected increasing pressure on balance of payments, especially of the low-income countries, it seemed reasonable then to expect that the needs for non-project food aid would increase at least in line with the rise in their total import requirements. It was, therefore, assumed that the share of non-project aid in the total cereal imports of food aid recipient countries would have to remain at its recent average ratio. However, no attempt was made to assess the ability of individual countries to pay for their imports, based on their likely foreign exchange inflows and the prevailing prices in the international cereals market. The WFP estimate for project aid was derived from a country by country survey and took into consideration the absorptive capacity of individual countries for this kind of aid. This was the first attempt to tackle the question of absorptive capacity in a quantitative way. Finally, the estimate for emergency food aid was based on a statistical analysis of the average incidence of crop failures, the most important cause of emergency situations in developing countries. Based on these assumptions, total food aid requirements in 1985 were estimated at 17.0 to 18.5 million tons of which 4.5 to 5.5 million tons represented project aid, 10.5 million tons non-project aid and the remaining 2.0 to 2.5 million tons emergency aid.

III. REVISED FAO APPROACH

All of the approaches referred to above define food aid requirements as the residual import needs which remain uncovered by commercial purchases. They are similar in many ways in their assessment of a country's total import requirements as the difference between projected demand and production, although differing concepts of demand have been used, ranging between a low level corresponding to effective demand and a high level corresponding to a normative concept of a nutritional standard. Where past approaches have mainly differed - and have generally been deficient - is in not taking into consideration the changing ability of food aid recipient countries to import cereals commercially.

Another difference relates to the country coverage of the various methodologies. In almost all previous assessments, the groups of countries considered as potential food aid recipients were incomplete in the sense that they left out a number of countries currently receiving food aid. This could bias downwards estimates of food aid requirements. In recent years, 111 countries in total have been receiving food aid regularly (see Annex). Of these, 65 are low-income food-deficit countries with a GNP per caput below the ceiling for IDA lending eligibility of US\$ 795 in 1981. However, countries outside this priority category have received about 1.5 million tons of food aid in cereals annually in recent years, or about 15 percent of total food aid shipments. There is no reason to believe that this situation will change in the near future. Thus, for a comprehensive assessment of food aid requirements, all 111 countries should be included in the analysis as potentially eligible food aid recipients.

A typical case of the imbalance between domestic production and total requirements of cereals in a food aid recipient country is depicted diagrammatically in the graph. Domestic production is consistently short of meeting total effective demand. Depending on the relative trends between the growth in domestic production and growth in demand, the implied import requirements can be growing or declining.

In any given year a country would be able to import commercially a certain quantity which, depending on its balance of payments position, could cover part or all of the import gap. The remaining deficit which a country is unable to meet either through domestic production or commercial imports constitutes its food aid requirements for that year. The stable component of these food aid requirements, defined as the difference between trend demand and the sum of trend production and trend commercial imports, constitutes food aid requirements for balance of payments support (non-project food aid). In addition, or in some cases a part of it, there are food aid requirements in support of developmental objectives (project food aid). Finally, besides these relatively stable components of food aid requirements, there is need for emergency food aid to fill

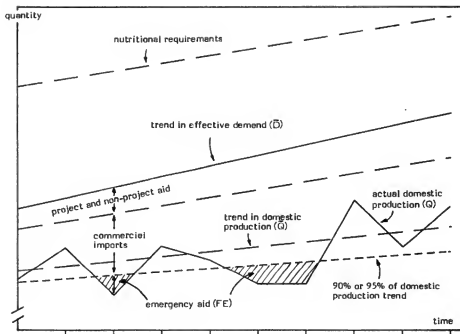
part of the gap in cases of excessive shortfalls in domestic production (see graph below). The approach used here to estimate these three components of food aid requirements will be dealt with in turn.

3.1 Non-project food aid

The starting point in the estimation of non-project food aid requirements in a future year is the assessment of the total gap between projected effective demand and projected production. Such projections for 1985 were carried out in two stages. In the first stage, the analysis was made on the twin assumptions of a continuation of current national policies affecting production, consumption and trade and of unchanged, constant (1975) relative prices. The approach consisted of projecting each component of a national "commodity balance sheet", that is to say, production, net import requirements or export availabilities and domestic demand, in order to allow linkages to be taken into account.

The preliminary results obtained from the first stage were reviewed in a global context, as the adoption of static assumptions of unchanged policies and constant prices led to "imbalances" by 1985 between demand and supply - and thus between global export availabilities and import requirements - for a number of commodities when the country results were aggregated. In such cases, these static assumptions were appropriately modified to better reflect the actual situation. Thus, projections were adjusted in order to obtain a better balance between world export availabilities and import requirements, and a more realistic indication of trends in international trade.

CLOSING THE GAP BETWEEN FOOD REQUIREMENTS AND AVAILABILITIES IN A TYPICAL FOOD AID RECIPIENT COUNTRY



(a) Demand projections

On the demand side projections were made for both human consumption and animal feed. Demand for human consumption was projected assuming direct linkage between per caput demand - by commodity - and the growth of private consumption expenditure. The demand functions, and the related elasticities, were selected for each commodity after analysis of recent national food consumption expenditure surveys, past time series of consumption and inter-country comparisons. Additionally, a trend component was included to reflect changes in consumption patterns and nutritional developments which were not directly linked to growth of income. Total projected demand for food was obtained, using the projections of per caput demand together with a population growth assumption.

The growth rates of private consumption expenditure were derived from alternative assumptions on growth of gross domestic product (GDP) based on data compiled from UN, OECD and World Bank sources, and supplemented by more recent estimates. Account was taken of known targets of national development plans in developing countries.

The projections of demand for animal feed were directly linked to the projections of livestock production, using input/output coefficients. These coefficients took account of recent trends and patterns of feed utilization, the composition of livestock rations, prospective changes in the efficiency and intensity of feed use. Demand for seed was projected in relation to area or domestic production, assuming appropriate seeding rates. Finally, an allowance was made for waste, taken as a proportion of total projected demand.

(b) Cereals production projections

Domestic production in 1985 was projected on the basis of alternative assessments of area and yield. In the first stage, initial statistical extrapolations of the area under annual crops were based on simple econometric models with time, deflated prices and lagged area taken as explanatory variables. Extrapolations of yields were based on time series analysis.

In each case, the initial statistical extrapolations served only as a starting point for the constant-price projections. In particular, adjustments were necessary to be made to take into account current national commodity policy objectives such as domestic self-sufficiency or export promotion, on-going commodity development projects which were expected to enhance growth rates, and major biological or physical constraints which may slow down future expansion of production.

The detailed country-by-country projections carried out initially in 1979 (FAO, 1979) have been reassessed and updated by FAO country and commodity specialists taking into account the changing economic prospects in individual countries.

On the basis of the above analysis total cereal import requirements ($\bar{R}_i$) for the i th food-aid recipient country can then be computed as the difference between projected effective demand ($\bar{D}_i$) and projected trend of domestic cereal production ($\bar{Q}_i$), i.e.,

$$\bar{R}_i = \bar{D}_i - \bar{Q}_i, \quad (1)$$

(c) Assessment of commercial cereal imports

The second stage in the estimation of non-project food aid requirements requires an assessment of commercial cereal imports. Traditionally, import demand functions have included prices and income as the main explanatory variables determining the level of imports. However, several attempts to estimate import demand functions of developing countries have not strongly supported this assumption. They have shown insignificant price, or even income effects. This seems hardly surprising since often quantitative restrictions due to shortages in foreign exchange have been more important in determining actual imports, in addition to, or instead of, prices and income. This aspect has been pointed out in the literature and suggestions have been made to incorporate foreign exchange earnings as an explanatory variable in the estimation of import demand ^{1/}.

^{1/} Abbott (1979), Leamer and Stern (1970) and Nabil (1980), among others.

Decisions regarding commercial cereal imports ought to be seen, and assessed, in the overall economic and social context of each individual country. Since foreign exchange will, as a rule, be scarce in the countries in need of food aid, the allocation of foreign exchange for cereal imports involves the setting of priorities relative to other essential import needs, taking into account the social and economic objectives pursued in each of the countries as well as price movements in world markets of all commodities and products which the countries concerned wish to import.

Such a broadly-based analysis of import demand behaviour does not seem feasible. However, a realistic assessment of commercial food imports should in the short and medium-term take into consideration a country's capacity to afford such imports. Other things being equal, the foreign exchange which a government allocates to the importation of cereals would depend to a considerable extent on the level of the country's export earnings. In addition to export earnings, the level of foreign exchange reserves, foreign capital inflows and debt servicing should be taken into consideration. However, due to lack of consistent data for the totality of the countries considered in this analysis and the difficulties inherent in making forward assessments of the levels of the latter three variables, they were not taken into account. Thus, the specification of the commercial import demand for cereals used in this analysis, relates the quantity of cereals imported to the level of export earnings and the per unit price of cereal imports. The behavioural relationship used to project commercial cereal imports in 1985 had the form:

$$\bar{I}_i = a_i (\bar{E}_i / \bar{P}_i)^{b_i} \quad (2)$$

where: $\bar{I}_i$ = projected commercial cereal imports in 1985;

$\bar{E}_i$ = projected export earnings in 1985 made up of merchandise, services and private transfers;

$\bar{P}_i$ = projected unit price of cereal imports in 1985;

a_i = the constant term of the estimated relationship; and

b_i = the estimated elasticity of cereal import demand with respect to the ratio of export earnings to cereal import prices.

Elasticities of commercial cereal import demand with respect to the ratio of export earnings to cereal import prices (b_i) have been estimated on a country by country basis, using data covering the period 1970 to 1981 ^{1/}. The import demand behaviour of food deficit importing countries in the past, as reflected by these estimated elasticities, was rather mixed. For some countries, the estimated elasticity was less than zero, implying a reduction in cereal imports when export earnings increased and vice versa. In other countries, estimated elasticities were much higher than unity, indicating a high propensity to import commercially as export earnings increased. These extreme elasticity values were not statistically significant, however, and they pertained to countries for which the data base was weakest. The majority of the elasticities which proved statistically significant ranged between 0.2 and 1.2, and these limits were assumed in the cereal import functions when estimated values were respectively below and above them.

The World Bank provides individual projections of international prices for wheat, milled rice and coarse grains to 1985, expressed in constant 1981 dollars. These were used to derive a composite cereal import price using the share of each commodity in the total cereal imports of food deficit

^{1/} The time series for commercial cereal imports and import prices used in the estimation were obtained from a data base constructed at the International Food Policy Research Institute. The IFPRI series covers the period 1961 to 1978, constructed from FAO aggregate cereal import volume and value data, and food aid figures compiled from other sources. This series was extended to 1981 using recent FAO data. The time series on each country's export earnings were obtained from the International Financial Statistics data base of the International Monetary Fund, converted to 1981 constant US dollars with the use of the World Bank price index of manufactured exports to developing countries.

countries. Export earnings to 1985 were obtained from extrapolation of 1970-81 estimated linear trends expressed in constant 1981 dollars. These projections were then entered in the estimated import functions to obtain commercial cereal imports in 1985.

Non-project food aid requirements for the i th country in 1985 were obtained as the difference between total cereal import requirements ($\bar{R}_i$) as given by equation (1) and commercial cereal imports ($\bar{I}_i$) as given in equation (2) above, i.e.,

$$\bar{FN}_i = \bar{R}_i - \bar{I}_i \quad (3)$$

and the global estimate of non-project food aid was obtained as the simple summation of country estimates, i.e.

$$FN = \sum_{i=1}^n \bar{FN}_i$$

where: n = the number of potential food aid recipients.

It should be noted that some countries might not form part of this summation either because their total cereal import requirements in 1985 are projected to be zero (i.e. domestic production fully covers estimated effective demand) or because non-project food aid requirements are projected to be zero (i.e. commercial cereal imports fully cover total import requirements). Formally, the countries that are excluded from this summation correspond to situations when:

$$\bar{R}_i \leq 0 \text{ and/or } \bar{FN}_i \leq 0.$$

3.2 Project food aid

Food aid has been increasingly used for employment promotion, investment in agricultural projects and nutrition intervention schemes. Food aid used to promote such undertakings is very much linked to each country's overall options for development and the existence of the necessary infrastructure and conditions which would make the food-for-work option, for example, administratively feasible and socially acceptable. Furthermore, food aid is usually allocated by donors for these purposes on the condition that the operation of such projects will lead to additional consumption of the food provided.

Under these conditions it is not useful to develop a general approach for the estimation of project aid requirements. Only an empirical, country-by-country approach can do justice to the varying conditions prevailing in food aid recipient countries which determine their absorptive capacity for this kind of aid.

The World Food Programme is uniquely placed to make such an empirical estimate of project aid needs, with the help of its out-posted officers. In its third survey of project food aid requirements, the WFP covered 69 countries which include all the major food aid recipients (see annex). Those countries comprise over 85 percent of the population of all food aid recipient countries and accounted for almost 90 percent of food aid shipments in cereals over the five-year period 1976/77 to 1980/81 inclusive. In addition to cereals, assessment of food aid requirements in dairy products and edible oils were included in view of their importance for project food aid and emergency assistance.

3.3 Emergency food aid

As indicated earlier, the third type of food aid requirements arises from emergency situations caused by natural and man-made disasters. Excessive food production shortfalls caused by unfavourable weather conditions such as drought are the most important among the emergencies under the category of natural disasters. Estimation of the level of food aid for this type of need necessarily has to be based on past records of cereal production performance of individual food aid

recipient countries. A 12-year time series of cereal production, 1970 to 1981, was considered for this analysis and *ex post* estimates were made of what would have been the average level of emergency food aid requirements during this period.

For year t , within the 1970-1981 time period, emergency requirements for the i th food aid recipient country were defined as:

$$FE_{it} = 0 \quad \text{if } Q_{it} > (1-h) \bar{Q}_{it} \text{ and} \\ FE_{it} = (1-h)\bar{Q}_{it} - Q_{it} \quad \text{if } Q_{it} < (1-h) \bar{Q}_{it}$$

where: Q_{it} = actual level of cereal production in country i in year t ;

$\bar{Q}_{it}$ = trend value of cereal production in country i in year t ; and

h = a predetermined level of production shortfall up to which food shortages are not considered excessive to trigger an emergency situation.

The level of emergency food aid required to overcome severe shortfalls in domestic production depends on the size and frequency of occurrences of such shortfalls, on the extent of national food reserves held for food security purposes, and on the ability of the government concerned to take remedial measures without outside assistance. In the earlier assessment of future food aid requirements (WFP/CFA, 1979) a downward deviation of more than five percent from the estimated trend value of domestic production was used as indicative of an emergency. This assumed that shortfalls of less than five percent could be met by most countries without outside assistance either through additional commercial imports, by drawing on reserve stocks when available, and/or by temporary downward adjustments in consumption levels. During the discussions of the subject by the CFA, some doubts were raised on whether the five percent deviation was appropriate for all countries. It was felt that higher income countries, and some countries that have invested in reserve stocks, could cope with downward deviations from trend larger than five percent by themselves.

The methodology used in 1983 to assess emergency aid took account of these considerations. It was assumed that countries in the higher income category are capable of coping with production shortfalls up to 10 percent from trend by themselves. The same trigger level for emergency situations was also used for a few countries in the low-income food-deficit category which have built substantial reserve stocks over the past years. For the remaining low-income food-deficit countries a shortfall greater than five percent from trend was taken as representing an emergency situation requiring assistance.

Global emergency requirements for a given year t were obtained by summing across all countries, i.e.,

$$FE_t = \sum_{i=1}^n FE_{it}$$

where: n = the number of potential food aid recipients.

Expressed on an average annual basis, global food aid emergency requirements become:

$$FE = \frac{1}{12} \sum_{t=1}^{12} FE_t$$

It should be noted here, however, that unlike non-project and project food aid requirements, the average level of food aid requirements for emergency assistance, as defined above, does not correspond directly to the level needed year after year. Actual emergency food aid requirements for a given year could be much higher or much lower than the long term average.

It should also be noted that no attempt was made to estimate the likely emergency food assistance needs of refugees which currently account for the bulk of multilateral emergency food aid. There is no objective method for estimating the likely number of new refugees or displaced persons requiring emergency assistance in the future. Nor is it possible to estimate how many of the refugees and displaced persons receiving such aid at present will continue to require assistance. Moreover, emergency aid should, by definition, be of a short-term nature; for refugee populations requiring assistance over a longer period, it is generally considered desirable to replace emergency aid by other forms of assistance.

IV. FOOD AID REQUIREMENTS IN 1985

4.1 Non-project food aid

(a) Overall requirements

Total import requirements to meet effective demand of all 111 countries considered in this analysis were estimated to increase by almost 21 percent from 70.6 million tons in 1978-80 to 85.3 million tons in 1985 (Table 1). The import requirements of the 65 low-income food-deficit countries were projected to grow by almost 10 million tons during this period, twice the growth of import requirements of countries in the higher income category. While during 1978-80 actual cereal imports of both categories were about 35 million tons each, by 1985, they are projected to grow to about 45 million tons for the former and to 40 million tons for the latter group. The overall increase amounts to 3.5 percent annually for the 111 countries as a whole. However, for low-income countries the increase amounts to about 4.5 percent annually compared to only 2.4 percent for food aid recipient countries in the higher-income category.

The estimated growth of commercial cereal imports of all food aid recipient countries was projected to lag behind the growth of their requirements, increasing by 15 percent over the period, or about 2.5 percent annually. From 61.8 million tons in 1978-80, commercial imports were estimated to increase to 71.1 million tons in 1985. Countries in the higher income category were projected to be able to cover nearly 95 percent of their projected cereal import requirements commercially, compared to about 70 percent for countries in the low-income category. The difference between the two economic groups in their capacity to meet their projected cereal import requirements is basically due to two factors. Firstly, in absolute terms the increase in the import requirements of low income countries is much higher than that of countries in the higher income category; requirements are seen to increase by 27 percent in the former compared to only 14 percent in the latter from 1978-80 to 1985. Secondly, the export earnings of higher income countries are projected to grow by about 27 percent from 1978-80 to 1985 compared to a slower growth of 21 percent for low income countries. Overall, for effective demand to be met, an increase in non-project food aid to 14.2 million tons is estimated to be required in 1985, about 5.4 million tons more than total food aid receipts during 1978-80.

According to the projections made here, 30 of the 111 countries receiving food aid in 1978-80 would no longer require non-project food aid in 1985. This is due to either an expansion in their domestic production and/or an increased ability to pay for commercial imports sufficient to cover their projected requirements. As expected, most of these countries are in the higher income category, geographically concentrated mainly in Latin America and the Caribbean and some in Asia and the Pacific. However, the great majority of the low-income food-deficit countries, 57 out of the total 65, would still have a substantial cereal gap in 1985 which needed to be covered by aid.

The cereal food aid requirements of these 57 low-income food-deficit countries would rise to 12 million tons in 1985, a 67 percent increase from their 1978-80 average food aid receipts of 7.2 million tons. As a whole, they account for about 85 percent of the total non-project food aid requirements estimated for 1985. By contrast, food aid requirements of the countries in the higher income category were projected to increase only marginally from 1.6 to 2.2 million tons from 1978-80 to 1985.

TABLE 1 - CEREAL IMPORTS IN 1978-80 AND PROJECTED COMMERCIAL IMPORTS AND NON-PROJECT FOOD AID REQUIREMENTS IN 1985 1/

Region 2/	Average cereal imports 1978-80		Estimated cereal import requirements in 1985		Change in cereal imports 1978-80 to 1985	
	Total	Commer- cial	Total	Aid	Total	Commer- cial
	(... million tons ...)	(%)	(... million tons ...)	(%)	(... percent ...)	
Low-income food-deficit countries	35.3	28.1	7.2	20	44.9	32.9
					12.0	27
						+17
						+67
North Africa/ Near East	8.3	6.2	2.1	25	11.0	6.7
						+32
						+8
						+106
Sub Saharan Africa	4.6	3.1	1.5	32	6.7	3.6
						3.1
						46
						+108
Asia/Pacific 3/	21.6	18.2	3.4	16	26.2	21.9
						4.3
						17
						+20
Latin America/ Caribbean	0.8	0.6	0.2	29	1.1	0.7
						0.3
						32
						+28
						+42
Other food aid recipient countries	35.6	33.7	1.6	5	40.4	38.2
						2.2
						5
						+13
						+35
All food aid recipient countries	70.6	61.8	8.8	13	85.3	71.1
						14.2
						17
						+21
						+15
						+61

1/ Totals may not add up because of rounding.

2/ See Annex for country composition of regions.

3/ Includes China.

(b) Regional distribution

Within the low-income food-deficit category, countries in Asia and the Pacific exhibit the lowest increase in food aid requirements to 1985, relative to the levels of 1978-80. Although total cereal import requirements of the region, including China, are estimated to increase by about 21 percent, commercial imports are also projected to increase by much the same rate, thus keeping pace with requirements. As a result food aid requirements in 1985 relative to total import requirements amount to 16.6 percent, a modest increase from the 15.7 percent level during 1978-80.

Similarly, for the low-income food-deficit countries in Latin America and the Caribbean total import requirements and commercial imports of cereals were expected to increase at similar rates. This, again, implies a modest increase in the share of food aid requirements relative to total imports, from 29 percent in 1978-80 to 32 percent in 1985.

However, the situation in the other two regions, North Africa and Near East, and Sub-Saharan Africa is completely different. Total cereal import requirements of the low-income food-deficit countries in these regions were expected to grow by 32 percent and 46 percent respectively, whereas their ability to pay for commercial imports is not expected to rise correspondingly. Much smaller increases in the volumes of commercial imports of 8 percent and 16 percent respectively are foreseen. As a consequence, food aid requirements relative to total imports would grow from 25 percent to 39 percent in North Africa and Near East, between 1978-80 to 1985. Egypt is projected to account for most of the increase in food aid requirements in this region. In Sub-Saharan Africa, the dependency on food aid imports of cereals would rise even more, to 46 percent by 1985 compared to 32 percent during 1978-80.

The deteriorating food situation in these two regions as reflected by their increasing dependence on food imports, and food aid imports in particular, echoes their experience during the 1970's. Domestic food production in these countries did not keep pace with population growth. For Sub-Saharan Africa in particular, the very poor performance of domestic food production coupled with a relative stagnation in export earnings has resulted in substantial reductions in per caput cereal availability. Even if the projected food aid requirements in 1985 become available to this region, per caput availability would increase only modestly. Per caput cereal availability in the region has decreased at an annual rate of 1.25 percent from 1974 to 1980, and an additional four million tons would have been required in 1980 merely to return to 1974 per caput availability levels. The estimated increase in food aid requirements of about 1.6 million tons by 1985 covers only one third of this deficit, without accounting for the extra demand due to population increases between 1980 and 1985. Thus, unless there is a dramatic increase in domestic production in Sub-Saharan Africa by 1985, which appears highly unlikely, the projected food aid requirements of the region represent a bare minimum, and are far below the level needed to achieve the per caput consumption levels that the region experienced in the past.

Total non-project food aid requirements for cereals, as estimated, amount to 14.2 million tons. This total, however, includes the non-project aid requirements for many countries which have also indicated food aid needs for food-for-work projects (see next section). Food-for-work projects contribute to economic development and to the growth in effective demand which is the basis for estimating non-project food aid requirements. Hence, in order to avoid possible double counting, the non-project food aid requirements were reduced from 14.2 million to 12.55 million tons, the difference of 1.65 million tons being the estimate of requirements for food-for-work projects for those countries which in addition were estimated to require non-project food aid.

4.2. Project food aid

(e) Overall requirements

As explained in the methodology above, project food aid requirements were based on a detailed country-by-country survey. The WFP survey results indicated that if supplies were available, project food aid in cereals for development support and nutrition projects could almost double by 1985. Requirements are projected to increase from 1.75 million tons per annum in the base period 1978-80 to 3.47 million tons in 1985 (Table 2). This is close to the projection made in the previous assessment of project food aid requirements (WFP/CFA, 1979) of 3.5 million to 4.0 million tons by 1985. While

development support projects currently absorb almost four-fifths of project aid in cereals, it is projected that the proportion going to nutrition projects will increase from 21 percent to about 42 percent by 1985.

Data on project food aid in edible oils and milk powder provided through the survey were less complete than for cereals. Questionnaire replies suggest that a significant part of food aid in these two commodity groups is provided on a non-project, bulk-supply basis, with less than 50 percent being supplied in the form of project food aid. However, the survey revealed substantial increases in project food aid needs for these commodities in the future. Requirements for edible oils (vegetable oils and butteroil) could increase from 130 000 tons per year (corresponding to the base period 1978-80) to 560 000 tons by 1985, the major part of this increase being absorbed in nutrition projects. Also, the absorption of project aid in the form of milk powder could increase from 90 000 tons per year (corresponding to the base period 1978-80) to 300 000 tons in 1985. Proportional increases were foreseen for milk powder, both for nutrition and for development support projects, including dairy development schemes.

(b) Requirements for food security reserves

Responses to the questionnaire indicated that out of the 38 countries in the process of building up food reserves, 27 had not been able to reach their targets owing to lack of cereal supplies. Drawing on information from this and other sources on the food reserve situation in these countries, it was estimated that 1.2 million tons of food aid in cereals a year would be required to help build up their food reserves to target levels by 1985. It should be noted that this estimate excludes the large increases in reserves being contemplated in such countries as China and India.

(c) Regional distribution of project food aid

In the period 1978-80, countries in Asia and the Pacific have received the highest proportion of project food aid of all three types of commodities, accounting for 53 percent in the case of cereals (Table 2). The remainder of the project aid in cereals was absorbed almost equally by North Africa and Near East, and Sub-Saharan Africa, with 22 percent and 19 percent respectively.

Food aid receipts by Latin America and the Caribbean have declined appreciably in recent years as most of the countries in that region fall outside the priority group of low-income food-deficit countries, on which food aid has been increasingly focussed. However, on a per caput basis, countries in this region have received quantities equal to those received in Asia and the Pacific although the absolute tonnage of project aid indicates a heavy emphasis on the latter region. In per caput terms, the emphasis of project aid during the base period 1978-80 has been on countries in Sub-Saharan Africa and in North Africa and the Near East which have received three and four times, respectively, more than food aid recipient countries in Latin America and the Caribbean as well as in Asia and the Pacific. Many countries in Latin America and the Caribbean have indicated, however, that they could absorb more project food aid by increasing the number of workers in development support projects and the beneficiaries in nutrition programmes, assuming food aid were made available on a significant scale and on a continuing basis. They have also stated that they have the administrative and logistical capacity for that purpose. Thus, on the basis of the survey, requirements for project aid in these regions were estimated to increase significantly by 1985 compared to 1978-80 levels.

Table 2 also shows the project aid received by the 31 least developed countries (LDC's) as well as the aid received by the broader priority category of the 65 low-income food-deficit countries. During 1978-80, LDC's received over one third of project food aid in cereals and milk powder and 15 percent of edible oils, whereas low-income food-deficit countries accounted for almost all of the project aid allocations. On the basis of the survey, the project aid requirements in cereals of low-income food-deficit countries were expected to increase by only 50 percent by 1985, compared to an overall increase by all countries covered of almost 100 percent. This would result in a decrease in their share in total project aid to 69 percent by 1985 compared to 91 percent in 1978-80. The share of LDCs would remain unchanged at 40 percent.

(d) Constraints to project food aid use

The survey also seems to indicate that in low-income food-deficit countries, the absorptive capacity for project food aid may be reached by or shortly after 1985 if certain major constraints are

TABLE 2 - PROJECT FOOD AID IN 1978-80 AND PROJECTED REQUIREMENTS IN 1985 ^{1/}

Region/ commodity categories ^{2/}	Average 1978-80			1985		
	Food-for-work projects ^{3/}	Nutrition project	Total	Food-for-work projects ^{3/}	Nutrition projects	Total
(..... million tons.....)						
North Africa/Near East						
Cereals	0.30	0.08	0.38	0.36	0.41	0.77
Edible Oils	0.01	0.01	0.02	0.02	0.07	0.09
Milk Powder	0.02	0.01	0.03	0.02	0.06	0.08
Sub-Saharan Africa						
Cereals	0.26	0.06	0.32	0.34	0.20	0.54
Edible Oils	0.01	0.01	0.02	0.06	0.05	0.11
Milk Powder	0.01	0.02	0.03	0.03	0.04	0.07
Asia/Pacific						
Cereals	0.77	0.15	0.92	0.94	0.31	1.25
Edible Oils	0.04	0.05	0.09	0.06	0.11	0.17
Milk Powder	0.02	0.02	0.04	0.04	0.03	0.07
Latin America/Caribbean						
Cereals	0.04	0.06	0.10	0.39	0.52	0.91
Edible Oils	... ^{4/}	0.01	0.01	0.01	0.18	0.19
Milk Powder	...	0.01	0.01	0.03	0.05	0.08
Total ^{5/}						
Cereals	1.39	0.36	1.75	2.02	1.45	3.47
Edible Oils	0.06	0.07	0.13	0.15	0.41	0.56
Milk Powder	0.04	0.05	0.09	0.12	0.18	0.30
Sub-Total: least developed countries ^{6/}						
Cereals	0.56	0.12	0.68	0.80	0.35	1.15
Edible Oils	0.01	0.01	0.02	0.01	0.04	0.05
Milk Powder	0.01	0.02	0.03	0.03	0.03	0.06
Sub-Total: low-income food-deficit countries ^{7/}						
Cereals	1.28	0.32	1.60	1.57	0.84	2.41
Edible Oils	0.05	0.06	0.11	0.08	0.23	0.31
Milk Powder	0.04	0.05	0.09	0.09	0.11	0.20

SOURCE: WFP, based on survey of WFP field officers.

^{1/} Based on replies from 69 countries. Excludes food security reserves.

^{2/} See Annex for country composition of regions.

^{3/} Includes dairy development and land settlement projects.

^{4/} Denotes less than 10 000 tons.

^{5/} Also includes small quantities outside the four regions.

^{6/} The 31 countries included by the United Nations in this category.

^{7/} Includes least developed countries.

not removed, whereas that of middle-income countries will not be so affected. The possibility of providing greater quantities of project food aid to the low-income food-deficit countries will, therefore, depend on the extent to which those constraints can be identified and removed. Thus, in addition to the quantitative assessment of project food aid requirements, the survey's objective was also to reveal the major constraints that have so far limited the use of food aid for food-for-work projects, nutrition projects and food reserve projects.

Logistical difficulties were identified as the primary constraint for all the three types of projects in all regions. Administrative, organizational and management constraints are ranked second for food-for-work projects. For food reserves, the lack of continuity and assurance of food aid supplies was identified as second in order of importance among existing constraints, and for nutrition projects, the shortage of financial resources and the acceptability of commodities provided as food aid.

4.3 Emergency food aid

As described in the methodology above, emergency food aid requirements to meet food scarcity conditions due to drought, crop failures and other natural causes were estimated using cereal production variations from 1970 to 1981 on a country-by-country basis. During this period, no rising trend in the absolute levels of production variability was observed. Therefore it seemed reasonable to assume that no increase in emergency requirements should be expected in the near future from the levels experienced during the 1970s. The results of this analysis for all 111 food aid recipient countries are shown in Table 3. The overall annual average requirements amount to three million tons. However, the statistical distribution is rather skewed; in two years out of three requirements would be less than three million tons.

As regards the regional distribution of emergency requirements, North Africa and Near East top the list, requiring on the average more than 1.1 million tons annually, or almost 38 percent of the total. This is so even though the majority of countries in that region are in the higher income category for which emergency situations were considered to exist only when production fell below 90 percent of trend. The Asia and the Pacific region would require nearly as much to meet emergency situations, on the average about 1.0 million tons annually. Sub-Saharan Africa is next in order of requirements with 0.5 million tons annually, followed by Latin America and the Caribbean with 340 thousand tons.

TABLE 3 - EMERGENCY FOOD AID REQUIREMENTS IN 1985 ^{1/}

Region ^{2/}	Average annual requirements ^{3/} (thousand tons)	Share of total (%)
<u>All food aid recipient countries</u>	<u>3 000</u>	<u>100</u>
North Africa/Near East	1 100	36
Sub-Saharan Africa	500	17
Asia/Pacific	1 000	33
Latin America/Caribbean	350	12
Others	50	2
<u>Low-income food-deficit countries</u>	<u>1 400</u>	<u>47</u>
<u>Other food aid recipients countries</u>	<u>1 600</u>	<u>53</u>

^{1/} Emergencies caused by drought, crop failure and other natural causes, not including the requirements of refugees or other victims of man-made or sudden natural disasters.

^{2/} See Annex I for country composition of regions.

^{3/} Emergency requirements are expected to be below 3 million tons in two years out of three; below 2 million tons in 42 % of all cases and below 1 million tons in 10 % of all cases.

4.4 Estimated requirements in 1985 compared with other estimates

Total food aid requirements in cereals for 1985 were estimated in 1983 at just over 20 million tons, about two million tons more than estimated in 1979 (WFP/CFA, 1979). Table 4 shows the three main elements of the total: project aid, non-project aid and emergency aid, along with actual food aid requirements in 1978-80 and the earlier food aid requirement estimates for 1985.

The new estimate for project aid - 4.65 million tons of cereals, including 1.2 million tons for food security reserves - is similar to the earlier estimate. Also, the new estimate for emergency aid of three million tons is consistent with the previous estimate, taking into consideration the broader country coverage of the present study, and in particular the inclusion of China.

The component which accounts for most of the difference between the new and old estimates is non-project food aid. The increase by two million tons in the non-project food aid requirements is mainly due to two factors. First, a new approach was used to estimate commercial cereal imports, reflecting better the commercial demand behaviour of food aid recipient countries. Second, on the basis of the recent export performance of those countries, projections of export earnings to 1985 were, overall, less optimistic than previous estimates.

TABLE 4 - FOOD AID SHIPMENTS IN 1978-80 AND ESTIMATED REQUIREMENTS IN 1985

Food aid objective	Actual food aid in 1978-80	Food aid requirements in 1985	
		previous estimate 1/	new estimate
		(. million tons)	
<u>Project aid 2/</u>	<u>1.75</u>	<u>4.5-5.5</u>	<u>4.65</u>
- Food-for-work projects 3/	1.39	5/	2.00
- Nutrition projects 4/	0.36	3/	1.45
- Food security reserves	6/	1.0-1.5 8/	1.20 8/
<u>Non-project aid</u>	<u>5.65</u>	<u>10.5</u>	<u>12.55</u>
<u>Emergency Aid</u>	<u>1.60 2/</u>	<u>2.0-2.5 7/</u>	<u>3.00 7/</u>
TOTAL	9.0	17.0-18.5	20.20

1/ Food aid Requirements and Food Aid Targets in the Eighties (WFP/CFA, 1979).

2/ Based on a country-by-country survey by WFP.

3/ Includes delay development and land settlement projects.

4/ Does not include food aid required to close the "calorie gap". The additional cereals needed to provide a satisfactory standard of nutrition for all undernourished people, in the food deficit countries considered, would amount to 45 million tons to meet 1.5 times the basal metabolic rate (BMR).

5/ No separate breakdown.

6/ Replies to the country-by-country survey indicated that only small quantities of food aid had been used for reserves - on average 22 000 tons in recent years.

7/ Based on a statistical analysis of the average incidence of crop failures leading to emergency situations in food aid recipient countries. It does not include an estimate of emergency requirements for refugees or as a result of natural disasters.

8/ Based on survey replies and other information; excludes requirements for large food reserves being contemplated in such countries as China and India.

Although fewer countries are expected to require non-project food aid in 1985 than at present, total non-project food aid needs was expected to increase substantially. This reflects a growing import gap of the remaining countries, coupled with a relatively slow increase in their ability to import cereals commercially. Thus, the total cereal import requirements of low-income food-deficit countries were expected to increase by 27 percent from the 1978-80 average to 1985 compared to a 17 percent increase in their commercial cereal imports. The result is a 67 percent increase in their non-project food aid requirements, accounting for 27 percent of their total cereal import needs in 1985 compared to 20 percent in 1978-80.

These sombre estimates could in reality prove conservative. Rising indebtedness in developing countries, which has not been taken into account in this study, additionally hampers their ability to finance imports. This is evident from the experience of the past few years when, even with low cereal prices on the international market, many low-income and middle-income developing countries have not succeeded in meeting their food requirements for current consumption and for building up security reserves. Moreover, in the assessment of the ability of low-income food-deficit countries to import commercially, import prices in 1985 have been assumed to be similar to present levels; commercial imports could be hampered still further in the event of an upward swing in prices on the world cereals market.

Table 5 compares the results obtained with those reported elsewhere. It also provides an overview of the main assumptions with regard to consumption coverage, commercial import demand and country coverage. On the consumption side, the various studies range from covering only effective demand to accounting for food requirements needed to satisfy some minimum nutritional standard. The consumption coverage of the present study falls between these two lower and upper limits. In addition to effective demand, specific requirements for project support, including nutritional projects, and emergency requirements were also taken into consideration.

With regard to assumptions made in projecting commercial cereal imports, and by implication food aid requirements, methodologies can be divided into two categories: (a) those which have projected the volume of commercial cereal imports (or food aid) on the basis of a share in total cereal import requirements during a past reference period, and (b) those which have projected the foreign exchange expenditure on cereal imports on the basis of a substantiated or assumed share in the total export earnings of a country in question. The latter is clearly preferred. This study has attempted to go a step further by estimating import demand elasticities with respect to export earnings and applying those elasticities to projecting commercial cereal imports on the basis of exogenous projections of export earnings. All of the approaches, however, have a common shortcoming: countries that historically have met a greater share of their cereal imports commercially are projected to continue doing so, in contrast to the countries that have imported very little commercially and have relied predominantly on food aid for their import needs.

The country coverage of different studies also varies, ranging from all developing countries to specific groups of countries considered particularly vulnerable and eligible for food aid. This aspect alone presents some difficulties in comparing estimated requirements. For example, countries not covered by the USDA study have received about 1.2 million tons of cereals as food aid in recent years, or about 13 percent of total food aid shipments in cereals. Nonetheless, after adjusting for the varying country coverage and the different years of projection, estimates presented in Table 5 which aim at comparable consumption coverage are very close.

TABLE 5 - COMPARISON OF ESTIMATES OF FOOD AID REQUIREMENTS

Study	Year of projection	Alternatives considered	Main assumptions on which projections were based			Total cereal import requirements	Food aid requirements
			Consumption	Commercial/food aid imports	Country coverage		
WFP/FAO (1979)	1985	(a) <u>Scenario "A"</u>	Included requirements for development projects and emergencies in addition to effective demand	Food aid assumed to cover the same share of total cereal import requirements as in a recent base period	All food aid recipients	74	17.0 - 18.5
	1990		Covered effective demand based on an accelerated pace of economic development	Food aid assumed to account for 32% of cereal imports of the most vulnerable group of countries and 10% for the other countries	(i) All developing (ii) 57 most vulnerable	110 38	15 12
FAO (1981)		(b) <u>Scenario "B"</u>	Covered effective demand based on a medium growth development path	Food aid assumed to account for a larger share of cereal imports equal to that experienced during 1969-71 (45%) of the most vulnerable group and 10% for the other countries	(i) All developing (ii) 57 most vulnerable	121 43	24 20
		(c) <u>Trend-based</u>	Assumed continuation of 1961-79 consumption trends with an upper limit for consumption given by the effective demand under (b) above	Same as in (b) above	(i) All developing (ii) 57 most vulnerable	135 47	26 21

(. . . million tons . . .)

IPPR1 (1983)	1990	(d) <u>Nutrition- based</u>	Same as in (c) above but assumed also that the calorie deficit of seriously undernourished people will be covered, this being equivalent to 40 million tons of cereals in 1990	Same as in (b) above	All developing	175	66
		(a) <u>Income- based</u>	Covered per capita consumption at 1975 base year, plus income-generated new demand	Commercial imports assumed to cover 5% or alternatively 2% of countries' export earnings	90 developing	92	16.6
		(b) <u>Consumption- based</u>	Assumed continuation of 1961-78 aggregate consumption trends in staple foods	Same as in (a)	90 developing	109	19.5
USDA (1983)	1983/84 (1984/85)	(c) <u>Nutrition- based</u>	Covered per capita consumption at amount necessary to provide 100% of FAO/WHO nutritional standard	Same as in (a)	90 developing	84	35.4
		(a) <u>Status quo</u>	Assumed per capita consumption maintained at 1979-82 average levels	Portion of adjusted total export earnings spent on food imports assumed not to exceed share experienced during a base period	67 developing	29.8 (29.1)	12.4 (11.2)
		(b) <u>Nutrition- based</u>	Covered per capita consumption at amount necessary to provide 100% of FAO/WHO nutritional standard	Same as in (a)	67 developing	48.4 (49.2)	32.8 (31.6)
This study	1985		Included requirements for development projects and emergencies in addition to effective demand	Commercial cereal imports estimated on the basis of past demand behavior, with export earnings as the variable explaining the level of imports	111 food aid recipients	85 1/	20.2 1/

1/ Covers only 81 out of the 111 countries, which remain in the food aid recipient category in 1985.

V. CONCLUSIONS

This new attempt to estimate food aid requirements has been made at a time when food aid recipients as well as food aid donors are passing through a period of serious economic difficulties. The world recession has not yet been overcome; budgetary and other constraints are causing a reduction in aid flows; and falling export earnings as well as rising debt burdens severely limit the ability of many developing countries to finance the most urgent imports, including those of food.

The utility of yet another estimate of food aid requirements might be questioned at a time when foreign aid efforts are generally flagging. Development assistance to agriculture is declining; the food aid target of at least 10 million tons of cereals annually which was set nine years ago has not yet been reached in spite of ample world supplies; the Food Aid Convention has been extended to 1986 at the previous level of aggregate commitments of 7.6 million tons of cereals annually; and the Committee on Food Aid Policies and Programmes, though recognizing at its 15th Session in May 1983 that food aid needs in cereals are substantially in excess of the nine million tons now being provided or the current target of 10 million tons, did not agree to increase this target.

However, a re-assessment of food aid needs might also be considered especially appropriate in today's circumstances. In view of the inability, to date, of the international community to meet agreed aid targets despite the pressing need for additional outside assistance to support national development efforts particularly in low-income countries, and in view of the periodic re-emergence of grain surpluses in several of the main producing and aid-giving countries which can only be controlled at considerable expense by the governments concerned, it seems essential to reconsider the feasibility of stepping up food aid deliveries to meet at least a part of the generally recognized external assistance needs. A re-assessment of food aid requirements can contribute to a better understanding of the magnitude and nature of overall foreign assistance needs of developing countries, and of the role which properly managed food aid can play in promoting development and improving the nutrition of the economically most vulnerable members of the world community.

The present approach towards estimating food aid requirements may be particularly relevant to such a broader evaluation of current and future assistance needs for agricultural development, and of the best way of meeting them. First, it estimates separately, on clearly stated assumptions, the needs for non-project food aid, project aid and emergency assistance. Secondly, it introduces an improved methodology for estimating non-project food aid needs, taking into account at least some of the exogenous factors which seriously limit the ability of many food deficit countries to pay for the food they need.

In view of the complexity of the task of estimating food aid requirements, any specific figure -- and its underlying methodology -- will be open to question. The results presented in this paper should, therefore, be taken as indicators of the approximate magnitude of likely food assistance needs in 1985 rather than as an attempt at an exact forecast. This applies particularly to the estimate of emergency needs which does not include the needs of refugees and other victims of man-made or sudden natural disasters. The project aid estimates are based on the results of a country-by-country survey by WFP field officers, not all of whom may have had enough information to make reliable forecasts. In estimating non-project food aid requirements, the calculation of commercial cereal imports took into account likely export earnings and import prices but not foreign exchange reserves and debt servicing obligations. Nor does the estimate of non-project aid include latent demand for food by those too poor to buy it. Moreover, some recognized flaws in the methodology -- such as the failure to take debt service obligations into account -- would suggest that the estimates of non-project food aid requirements may be on the conservative side. On the whole, a comparison of the results of the various recent estimates or forecasts reviewed in this paper all point to a substantial increase in future food aid needs, regardless of the differences in the methodologies employed and the periods for which the estimates were made.

LITERATURE CITED

- Abbot, P.C. (1979), Modeling International Grain Trade with Government Controlled Markets, Amer. J. Agr. Econ., Vol. 61, pp. 22-31.
- FAO (1954), Disposal of Agricultural Surpluses, Commodity Policy Studies, No. 5, Rome
- FAO (1961), Development Through Food Aid: A Strategy for Surplus Utilization, Food and Agriculture Organization of the United Nations, Rome.
- FAO (1977), The Fourth World Food Survey, Food and Agriculture Organization of the United Nations, Rome.
- FAO (1979), Agricultural Commodity Projections, Food and Agriculture Organization of the United Nations, Economic and Social Development Series, No. 16, Rome.
- FAO (1981), Agriculture Toward 2000, Food and Agriculture Organization of the United Nations, Rome.
- IDS (1983), Food as Aid: Food for Thought, Institute of Development Studies, University of Sussex, Bulletin Vol. 14 No. 2, Brighton.
- IFPRI (1983), Closing the Cereals Gap with Trade and Food Aid, by B. Huddleston, International Food Policy Research Institute, Washington D.C. (forthcoming Research Report).
- Leamer, E.O. and Stern, R.M. (1970), Quantitative International Economics, Boston, Allyn and Bacon Inc.
- Nabli, M.K. (1980), The Estimation of Import Functions under Foreign Exchange Control, Economie Appliquée, Tome XXXIII, No. 3-4, pp. 727-747.
- USDA (1982, 1983), World Food Aid Needs and Availabilities, United States Department of Agriculture, Economic Research Service, Washington D.C.
- WFP (1978), Report of the Fifth Session of the UN/FAO Committee on Food Aid Policies and Programmes, Rome, 10-21 April 1978.
- WFP/CFA (1978), Interim Report on the Assessment of Food Aid Requirements, Including the Question of Food Aid Targets, UN/FAO Committee on Food Aid Policies and Programmes, Fifth Session, Rome, 10-21 April 1978.
- WFP/CFA (1979), Food Aid Requirements and Food Aid Targets in the Eighties, UN/FAO Committee of Food Aid Policies and Programmes, Eighth Session, Rome, 22-31 October 1979.
- WFP/CFA (1983), Food Aid Requirements and Food Aid Targets: Estimated Requirements in 1985, UN/FAO Committee of Food Aid Policies and Programmes, Fifteenth Session, Rome, 15-27 May 1983.

ANNEX - LIST OF FOOD AID RECIPIENT COUNTRIES 1/

A. Low-Income Food Deficit Countries (65)

NORTH AFRICA AND

NEAR EAST (4)

- *Egypt
- *Sudan
- *Yemen A.R.
- *Yemen P.O.R.

SUB-SAHARAN

AFRICA (35)

- Angola
- Benin
- *Burundi
- *Cameroon
- Cape Verde
- *Centr. Afr. Rep
- Chad
- Comoros
- Djibouti
- Eq. Guinea
- *Ethiopia
- *Gambia
- *Ghana
- *Guinea
- *Guinea Bissau
- *Kenya

- *Lesotho
- Liberia
- *Madagascar
- *Malawi
- *Mali
- *Mauritania
- *Mozambique
- *Niger
- *Rwanda
- Sao Tome
- *Senegal
- *Sierra Leone
- *Somalia
- *Tanzania
- Togo
- Uganda
- *Upper Volta
- Zaire
- *Zambia

ASIA AND PACIFIC (19)

- *Afghanistan
- *Bangladesh
- *Bhutan

- *China
- *India
- *Indonesia
- *Kampuchea
- Kiribati
- Lao
- Maldives
- *Nepal
- *Pakistan
- *Philippines
- Samoa
- Solomon Islands
- *Sri Lanka
- Tonga
- Vanuatu
- *Viet Nam

LATIN AMERICA (7)

- *Bolivia
- *Dominica
- *El Salvador
- Guyana
- *Haiti
- *Honduras
- *St. Vincent

B. Other Food Aid Recipient Countries (46)

NORTH AFRICA AND

NEAR EAST (8)

- *Algeria
- Iraq
- *Jordan
- Lebanon
- *Morocco
- *Syria
- *Tunisia
- *Turkey

- Mauritius
- Seychelles
- *Swaziland
- Western Sahara
- *Zimbabwe

ASIA AND PACIFIC (6)

- Burma
- *Fiji
- *Korea, Rep. of
- Malaysia
- Singapore
- *Thailand

LATIN AMERICA (18)

- *Barbados
- Brazil
- Chile
- *Colombia

- *Costa Rica
- Dominican Rep.
- *Ecuador
- Grenada
- Guatemala
- Jamaica
- Nicaragua
- Panama
- *Paraguay
- *Peru
- *St. Kitts-Nevis
- *St. Lucia
- Surinam
- Uruguay

SUB-SAHARAN

AFRICA (9)

- *Botswana
- *Congo
- Gabon
- Ivory Coast

OTHERS (5)

- *Cyprus
- Gaza strip
- Portugal
- Malta
- Israel

1/ Countries indicated by an asterisk (plus Antigua and Mexico) have responded to the country-by-country survey for project food aid requirements.

